Pearson Edexcel

Mark Scheme (Results)

Summer 2023

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Higher (Calculator) Paper 3H

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General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

1 All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

2 All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

Questions where working is not required: In general, the correct answer should be given full marks.

Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

3 Crossed out work

This should be marked **unless** the candidate has replaced it with an alternative response.

4 Choice of method

If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

5 Incorrect method

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.

6 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

7 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (eg an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

8 Probability

Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9 Linear equations

Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

10 Range of answers

Unless otherwise stated, when an answer is given as a range (eg 3.5 – 4.2) then this is inclusive of the end points (eg 3.5, 4.2) and all numbers within the range

11 Number in brackets after a calculation

Where there is a number in brackets after a calculation eg 2 × 6 (=12) then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

12 Use of inverted commas

Some numbers in the mark scheme will appear inside inverted commas eg "12" × 50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

13 Word in square brackets

Where a word is used in square brackets eg [area] × 1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

14 Misread

If a candidate misreads a number from the question. eg uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

Guidance on the use of abbreviations within this mark scheme	
M	method mark awarded for a correct method or partial method
P	process mark awarded for a correct process as part of a problem solving question
A	accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)
C	communication mark awarded for a fully correct statement(s) with no contradiction or ambiguity
B	unconditional accuracy mark (no method needed)
oe	or equivalent
cao	correct answer only
ft	follow through (when appropriate as per mark scheme)
sc	special case
dep	dependent (on a previous mark)
indep	independent
awrt	answer which rounds to
isw	ignore subsequent working

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
1 (a)	m^6	B1	cao	
(b)	x^{13}	B1	cao	
(c)	$4p^3 + 12p^2$	B2	for $4p^3 + 12p^2$	
		(B1	for expanding the bracket to get $p^3 + 3p^2$ **or** $4p^3$ **or** $12p^2$)	
2 (a)	11533	P1	for working with 68%, eg 800 × 0.68 (= 544 people) oe or "16960" × 0.68 oe	Percentage calculation could be done at any stage
		P1	for a correct process, other than that of finding a %, eg "544" × 2 (= 1088) or 10.6 × 2 (= 21.2) or 800 × 2 (= 1600) or "544" × 10.6 (= 5766.4) or 800 × 10.6 (= 8480)	
		P1	for full process to find amount of coffee required eg "1088" × 10.6 or "544" × "21.2" or "5766.4" × 2 (= 11532.8) or for an answer of 11532	
		A1	for answer in the range 11532.5 to 11533	An answer within the range shown in working but incorrectly rounded gets full marks.
(b)	Statement	C1	for a correct statement **Acceptable examples** the amount will be more he will need more coffee it is an underestimate my answer in part (a) means there would not be enough for everyone he will need 12211(.2) needs 678(.4) more **Not acceptable examples** amount will decrease amount of coffee will change	If figures are given as part of the answer they must be correct, but can allow ft.

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
3	Shown with reasons	M1	for method to find *ACD* using parallel lines eg *BCA* = 125 **and** *ACD* = 180 – 125 (= 55) **or** *BCF* = 180 – 125 (= 55) = *ACD* **or** *FCD* = 125 **and** *ACD* = 180 – 125 (= 55) **or** *CFG* = 180 – 125 (= 55) = *ACD*	Angles must be clearly labelled on the diagram or otherwise identified. Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		M1	for method to find *ADC* eg 180 – 110 (= 70) **or** for method to find *CAD* eg 180 – ("70" + "55") (= 55) or 110 – "55" (= 55)	
		A1	for *ACD* = 55 **and** *CAD* = 55	
		C1	for one correct parallel lines reason linked to their method eg Corresponding angles are equal Allied angles / Co-interior angles add up to 180 Alternate angles are equal	Underlined words need to be shown; reasons need to be linked to their method, which can be implied from correctly identified angles (stated or written on the diagram).
		C1	for one other reason stated linked to their method eg Angles on a straight line add up to 180 Angles in a triangle add up to 180 Vertically opposite angles are equal OR Vertically opposite angles are equal The exterior angle of a triangle is equal to the sum of the interior opposite angles. Angles in a quadrilateral add up to 360. Accept "4-sided shape"	
4	17.5	P1	for a first step, eg 5 × 14 (= 70) or 14 ÷ 4 (= 3.5) or 5 ÷ 4 (= 1.25) or 4 ÷ 5 (= 0.8)	Could be done algebraically. 11.2 as answer scores no marks.
		A1	oe	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
5 (a)	63	B1	for 63, accept $3 \times 3 \times 7$ or $3^2 \times 7$	
(b)	15 876	M1	for at least two of 2^2, 3^4, 7^2 **or** shows at least 3 multiples of 2268, eg 2268, 4536, 6804 and at least 3 multiples of 441, eg 441, 882, 1323	(A =) $2^2 \times 3^4 \times 7$ scores 0 marks
		A1	for 15 876 or $2^2 \times 3^4 \times 7^2$ oe	
6	65	P1	for a correct process to find the number of seconds, eg 67 205 600 ÷ 11.9 (= 5 647 529.4...) **or** for a correct process to convert between seconds and days, eg 24 × 60 × 60 (= 86 400) oe, may be seen in stages or 11.9 × 60 × 60 × 24 (= 1 028 160)	Note that this mark may be awarded at any stage in the working.
		P1	for a complete process, eg "5 647 529.4..." ÷ "86 400" or 67 205 600 ÷ "1 028 160"	
		A1	accept answers in the range 65 to 65.4 or 66	If a correct answer within the range is shown in working but incorrectly rounded award full marks.
7 (a)	(1, –3)	B1	cao	
(b)	–0.7 or 2.7	B1	for an answer in the range –0.8 to –0.6 or 2.6 to 2.8	
8	648	M1	for substitution into density formula eg 9×72 or $9 = \frac{m}{72}$	
		A1	cao	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
9	56	P1 A1	for 70 × 80 ÷ 100 oe or for the use of 0.7 × 0.8 (= 0.56) oe cao	
10	3.1	P1 P1 A1	for using sin to find length of *AC*, eg 6.8 × sin 41 **or** a full process to find *AC* or (*AC* =) 4.46... **or** a full process to find *AD* or (*AD* =) 5.44… for a complete process to find a relationship involving *DC* eg tan 55 = $\frac{"4.46..."}{DC}$ or (*DC* =) $\frac{"4.46..."}{\tan 55}$ **or** cos 55 = $\frac{DC}{"5.44..."}$ answer in the range 3.1 to 3.2	Accept rounded or truncated figures. If a correct answer within the range is shown in working but is incorrectly rounded, award full marks.
11 (a)	Box plot	B3 (B2 (B1	for fully correct box plot for box plot showing a box and whiskers and at least 3 correctly plotted values from 169, 174, 177, 180, 186) for at least 2 correctly plotted values including a box or whiskers)	Box can be of any height. Accept ends that are marked (eg line, cross, dot) or defined by the end of the whiskers if clear
(b)	Comparisons	C1 C1	(ft) for a correct comparison of medians, eg the median for Adults is greater than the median for Teenagers or the Teenagers heights are lower in general as the median is lower (ft) for a correct comparison of a measure of spread, eg the interquartile (range) of the Adults is the same as (similar to) the IQR of the Teenagers, the range of the Teenagers is greater than the range of the Adults Comparisons for this mark can relate to the range or the IQR.	For 2 marks, at least one comparison must be in context (eg refers to heights or cm). Simply quoting values for median and range and IQR is insufficient, they must be compared Median Range IQR Adults 177 17 6 Teenagers 169 20.5 6 Figures need not be seen but if given they must be correct.

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
12	Shown	M1	for a method to find the product of two linear expressions (3 out of 4 terms correct or 4 correct terms ignoring signs) eg $x^2 + 3x - x - 3$ or $x^2 + 3x - 5x - 15$ or $x^2 - 5x - x + 5$	Note that (eg) $2x - 3$ in expansion of $(x - 1)(x + 3)$ is to be regarded as 3 correct terms.
		M1	for a complete method to obtain all terms, half of which are correct (ft their first product) eg $x^3 - 5x^2 - 10x + 2x^2 - 3x + 15$	First product must be quadratic with at least 3 terms but need not be simplified or may be simplified incorrectly
		A1	for $x^3 - 3x^2 - 13x + 15$ shown, accept $x^3 + -3x^2 + -13x + 15$	
13	Proof	M1	for giving a general term for a consecutive triangular number eg $\frac{(n+1)(n+2)}{2}$ or $\frac{(n-1)n}{2}$	
		M1	for $\frac{n(n+1)}{2} + \frac{(n+1)(n+2)}{2}$ or $\frac{(n-1)n}{2} + \frac{n(n+1)}{2}$ oe	
		C1	for completing the proof to show a square number, eg $(n + 1)^2$ or n^2	
14	19.9	P1	for substituting into the cosine rule to find *OB*, eg $(OB^2) = 9^2 + 6^2 - 2 \times 9 \times 6 \times \cos 35$	
		P1	for using correct order of operations eg 81 + 36 – 88.46... (= 28.5...)	May be implied by *OB* = 5.34.... Values may be rounded or truncated.
		P1	for process to find the area of the sector, eg $\frac{80}{360} \times \pi \times$ "$5.34...^2$"	
		A1	for answer in the range 19.8 to 20	If a correct answer within the range is shown in working but incorrectly rounded award full marks.

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
15 (a)	$(a - b)(a + b)$	B1	for $(a - b)(a + b)$ oe	
(b)	Relationship shown	M1	for factorising the expression, eg $(2^{20} - 1)(2^{20} + 1)$ or for $(2^{40} =) (2^{20})^2$	Note that 1048575 and 1048577 earns 2 marks as an alternative approach
		C1	for explanation, eg 2^{20} is even so $2^{20} - 1$ and $2^{20} + 1$ are odd (leading to conclusion)	
16	Triangle at (6, –2) (4, 4) (8, 4)	M1	for the correct shape in the correct orientation in the wrong position or for two correct points	
		A1	cao	
17 (a)	16.5 to 19.5	M1	for tangent drawn at $t = 2.5$	The tangent must be seen to award any marks
		M1	dep (M1) for a complete method to find the gradient from tangent eg $(48 - 0) \div (4 - 1.4)$ (= 18.4...)	
		A1	for answer in the range 16.5 to 19.5 or ft acceptable tangent	Award 0 marks for a correct answer (in the range) with no (or incorrect) supportive working
(b)	Description	C1	eg speed or velocity	"speed" may be expressed in a different way, eg distance per unit time (at that point) Award if extra information is given provided not contradictory.

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
18	98.8	P1	for process to find the radius of the top of the frustum eg $6 \div 10 \times 3$ (= 1.8)	Accept rounded or truncated values Accept multiples of π for process marks.
		P1	for process to find the curved surface area of the frustum eg $3 \times \pi \times 10 - \text{“1.8”} \times \pi \times 6$ (= 60.3...)	
		P1	for process to find the area of either circular face eg $\pi \times 3^2$ (= 28.27...) **or** $\pi \times \text{“1.8”}^2$ (= 10.1...)	
		P1	for a process to find the curved surface area + the area of at least one circular face eg $3 \times \pi \times 10 - \text{“1.8”} \times \pi \times 6 + \pi \times 3^2$ (= 88.5...) **or** $3 \times \pi \times 10 - \text{“1.8”} \times \pi \times 6 + \pi \times \text{“1.8”}^2$ (= 70.49....)	
		A1	for an answer in the range 98.7 to 98.8	If a correct answer within the range is shown in working but incorrectly rounded award full marks.
19	Statement	C1	for explanation **Acceptable examples** should go through (0, 1) should not go through (0, 0) it has touched the *x*-axis $3^0 = 1$ $3^0 \neq 0$ **Not acceptable examples** the graph has been drawn wrong axes are not labelled	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
20	Proof	M1	for ($10x$ =) 1.2323… or ($100x$ =) 12.323… or ($1000x$ =) 123.23…	Any recurring notation acceptable throughout. Proofs with terminating decimals (at least 5 figures) score M1M1C0
		M1	(dep M1) for a method using two recurring decimals that leads to a terminating decimal difference, using correct multiples of x eg ($1000x - 10x$ =) 123.23 … − 1.23 … (= 122) or $\frac{122}{990}$ or ($100x - x$ =) 12.323 … − 0.123 … (= 12.2) or $\frac{12.2}{99}$	
		C1	for completing algebra to $\frac{61}{495}$	
21	–2 and $-\frac{3}{2}$	M1	for writing a correct equation without fractions eg $(2 - 2x) + 3(x + 4) = (2 - 2x)(x + 4)$ oe	
		M1	for simplifying to a correct equation in the form $ax^2 + bx + c$ (= 0), eg $2x^2 + 7x + 6$ (= 0)	
		M1	for method to solve a correct quadratic equation, eg $(2x + 3)(x + 2)$ (= 0) or correct substitution into the formula or for correctly completing the square	
		A1	for –2 and $-\frac{3}{2}$ oe	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
22	$b = 3a$	P1	for $a\binom{2}{6} + b\binom{8}{2} = k\binom{13}{6}$ oe or for setting up a linear equation in a or b eg $2a + 8b = 13k$ or $6a + 2b = 6k$, $k \neq 0, 1$ **or** for $2a + 8b = 13$ and $6a + 2b = 6$ **or** for $\frac{2a+8b}{6a+2b} = \frac{13}{6}$ oe	Accept any non zero value substituted for k
		P1	for process to solve the simultaneous equations to get $b = \frac{3k}{2}$ and $a = \frac{k}{2}$ or $b = \frac{3}{2}$ and $a = \frac{1}{2}$ **or** both $2a + 8b = 13k$ and $6a + 2b = 6k$ with process to eliminate k	
		A1	for $b = 3a$ oe	

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
23	No (supported)	P1	for a first step, eg to find the gradient of the line (normal) joining (0, 0) to (–3, 4), eg $\frac{4-0}{-3-0}$ $(= -\frac{4}{3})$ **OR** finds the length^2 for one side of triangle, eg $(-3--8)^2+(4-0)^2$ (= 41) or $(-3-0)^2+(4-0)^2$ (= 25) or 64	Alternative processes may be seen and should be duly credited.
		P1	for a second step, eg to find the gradient of the tangent, eg $-1 \div$ "$\frac{-4}{3}$" $(= \frac{3}{4})$ **OR** finds the length^2 for two sides of triangle, two of 25, 41 and 64	
		P1	for a third step, eg to find the gradient of the line joining (–8, 0) to (–3, 4), $\frac{4-0}{-3--8}$ $(= \frac{4}{5})$ or finds the equation of the tangent, eg $y = \frac{3}{4}x + \frac{25}{4}$ or $y - 4 = \frac{3}{4}(x - -3)$ **OR** for process to use Pythagoras' rule, eg 41 + 25 (= 66) or 64 − 25 (= 39) or 64 − 41 (= 23)	
		C1	for No from correct figures and a complete process from comparison of gradients, eg $\frac{3}{4}$ and $\frac{4}{5}$ or showing the equation of the tangent does not pass through (–8, 0), eg when $x = -8$, $y = \frac{1}{4}$ (not 0) or when $y = 0$, $x = -\frac{25}{3}$ (not –8) **OR** correct figures from Pythagoras' rule, eg 41 + 25 (= 66) ≠ 64 or 64 – 41 ≠ 25 or 64 – 25 ≠ 41 oe	Award 0 marks for No without complete and correct supportive working

Paper: 1MA1/3H				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
24	$\frac{5x^2-23x+50}{9x^2-3x}$	P1	for using $y = 3x$ or $x = \frac{1}{3}y$ to obtain an expression for a probability in one variable	This may be awarded at any time
		P1	for a correct second probability eg $\frac{x-1}{y-1}$ or $\frac{x-1}{3x-1}$ or $\frac{4}{y-1}$ or $\frac{4}{3x-1}$ or $\frac{y-x-6}{y-1}$ or $\frac{2x-6}{3x-1}$	
		P1	for forming a correct product eg $\frac{x}{y} \times \frac{x-1}{y-1}$ or $\frac{x}{3x} \times \frac{x-1}{3x-1}$ or $\frac{5}{y} \times \frac{4}{y-1}$ or $\frac{5}{3x} \times \frac{4}{3x-1}$ or $\frac{y-x-5}{y} \times \frac{y-x-6}{y-1}$ or $\frac{2x-5}{3x} \times \frac{2x-6}{3x-1}$	
		P1	for adding the 3 correct probabilities eg $\frac{x}{y} \times \frac{x-1}{y-1} + \frac{5}{y} \times \frac{4}{y-1} + \frac{y-x-5}{y} \times \frac{y-x-6}{y-1}$ or $\frac{x}{3x} \times \frac{x-1}{3x-1} + \frac{5}{3x} \times \frac{4}{3x-1} + \frac{2x-5}{3x} \times \frac{2x-6}{3x-1}$	Can be seen after processing of algebra
		A1	$\frac{5x^2-23x+50}{9x^2-3x}$	

Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 3H

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme. Notes apply to both MLP papers and Braille papers unless otherwise stated.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5º
Measurements of length: ±5 mm

PAPER: 1MA1_3H			
Question		**Modification**	**Mark scheme notes**
1	(b)	Letter 'x' changed to 'y'.	Standard mark scheme but note change of letter.
2	(a)	Letter 'g' at end of answer line changed to 'grams'	Standard mark scheme
3		Wording added 'Look at the diagram for Question 3 in the Diagram Booklet. It shows triangle AGF and two straight lines ACF and ADG.' Wording removed 'ACF and ADG are straight lines.' Wording added 'Angle CDG = 110°; Angle EFC = 125°' Diagram enlarged. Angles moved outside of angle arcs. Angle arcs made smaller.	Standard mark scheme
5	(b)	Wording added 'Remember: A = $2^2 \times 3^4 \times 7$ B = $3^2 \times 7^2$'	Standard mark scheme
7		Wording added 'Look at the diagram for Question 7 in the Diagram Booklet. It shows'. Wording 'Here is' removed. Diagram enlarged. Axes labels moved to above the vertical axes and right of the horizontal axes.	Standard mark scheme
8		Letter 'g' at end of answer line changed to 'grams'	Standard mark scheme

10		Wording added ‘Look at the diagram for Question 10 in the Diagram Booklet. It shows a triangle ABD.’ Wording removed ‘ABD is a triangle.’ Diagram enlarged. Angles moved out of angle arcs. Angle arcs made smaller. Right angles made more obvious. Wording added ‘AB = 6.8 cm; Angle ABC = 41°; Angle ADC = 55° ’ Wording added: Angle ACB and angle ACD are right angles.	Standard mark scheme
11		Wording added ‘below’. Table enlarged and left aligned. Values changed in the table, so values can be plotted on the modified grid. 169 cm changed to 170 cm; 186 cm changed to 185 cm; 177 cm changed to 177.5 cm, 174 cm changed to 175 cm	
11	(a)	Wording added ‘Look at the diagram for Question 11(a) in the Diagram Booklet. It shows a grid.’ Diagram enlarged, no small squares. Open headed arrow. Axis label moved to the left of the horizontal axis.	Standard mark scheme but using the key values: 170, 175, 177.5, 180, 185
11	(b)	Wording added ‘Look at the diagram for Question 11(b) in the Diagram Booklet. It is a box plot showing the distribution of the heights of a group of teenagers.’ Wording removed ‘below’. Diagram enlarged. Small squares removed. Open headed arrow. Axis label moved to the left of the horizontal axis. Box plot changed so values can be read on the modified grid: Key values now at 157.5, 165, 167.5, 172.5, 177.5	Standard mark scheme but using the new key values: Median Range IQR Adults 177.5 15 5 Teenagers 167.5 20 7.5
14		Wording added ‘Look at the diagram for Question 14 in the Diagram Booklet.’ Diagram enlarged. Angles moved out of angle arcs. Angle arcs made smaller. Wording added ‘BA = 9 cm; AO = 6 cm; Angle BAO = 35°; Angle BOC = 80	Standard mark scheme
15	(a)	Letter ‘*a*’ changed to ‘*x*’; Letter ‘*b*’ changed to ‘*y*’.	Standard mark scheme but note change of letter.

16		Wording added ‘Look at the diagram for Question 16 in the Diagram Booklet. It shows triangle T and triangle U on a grid.’ Diagram enlarged. Open headed arrows. Axes labels moved to above the vertical axes and right of the horizontal axes. Triangle U added on the grid. Shapes labelled as ‘triangle T’ and ‘triangle U’. Shading changed. Question changed. Wording removed ‘On the grid, enlarge triangle T by scale factor -2 with centre of enlargement (-2,-2)’ Wording added ‘Describe fully the single transformation that maps triangle T onto triangle U.’	B2 for enlargement scale factor −2 centre (−2, −2) (B1 for two of these three aspects) Award no marks if more than one transformation is given.
17		Wording removed ‘Here is’. Wording added ‘Look at the diagram for Question 17 in the Diagram Booklet. It shows’. Diagram enlarged. Open headed arrows. Right axis labelled. Small squares removed.	Standard mark scheme
18		Wording added ‘Look at Diagram 1, Diagram 2 and the formula for Question 18 in the Diagram Booklet. You may be provided with two models for this question and an additional formula model. They show a cone and a frustum.’ Wording removed ‘in the diagram.’ Wording added ‘by Diagram 1 and the models. Diagram 2 is a simplified 2D diagram of the frustum.’ Formula diagram enlarged and a formula model provided. Wording added to the formula ‘You may be provided with a model.’ 3D frustum diagram enlarged. Dashed lines made longer and thicker. Open headed arrows. 2D diagram added. Model of frustum provided. Braille additional wording: Ask for the model for Question 18. The model is a large cone made from a small cone and a frustum. The small cone is detachable from the frustum. On the model: the slant height of the small cone is 6 cm; the slant height of the large cone is 10 cm the slant height of the frustum is 4 cm; the radius of the base of the large cone is 3 cm.”	Standard mark scheme

19		Wording added ‘Look at the diagram for Question 19 in the Diagram Booklet. It shows a graph.’ ‘$0 \leq x \leq 4$’ changed to ‘$0 \leq x \leq 2$’ Wording added ‘in the Diagram Booklet’ Diagram enlarged but produced only in the range $0 \leq x \leq 2$.. Small squares removed. Right axis labelled. y axis cut at 10; x axis cut at 2. Axes labels moved to above the vertical axes and right of the horizontal axes.	Standard mark scheme
21		Letter ‘x’ changed to ‘y’.	Standard mark scheme but note change of letter.

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